

PROPOSED CLAIM AMENDMENT

Claim 1 (Currently amended) A gas delivery metering tube for delivering a gas, comprising:

an innermost elongated tube, said innermost tube having two ends, a gas delivery end that is attached to a gas supply, and an opposite, capped end, one or more arrays of orifices being formed in said innermost tube and extending along ~~the~~a substantial length of said innermost tube; and

an outermost elongated tube, ~~said outermost tube having two ends where one end is disposed proximate to the gas delivery end of the innermost tube, tube having~~ one or more arrays of orifices being formed in ~~said outermost tube and extending along~~ the~~a~~ substantial length of said outermost tube, said outermost tube being disposed such that it is nested and axially aligned with said innermost tube and such that an effective annular space is formed between said at least ~~one~~ innermost and outermost nested tubes;

wherein gas flowing into the innermost tube from the gas supply is introduced into ~~the~~an interior of the innermost tube at the gas delivery end, and wherein the innermost tube has the following properties:

$$L/D < 70$$

$$D/d \approx > 10$$

$$NA_{por}/A_{tube} \approx <1$$

where L is the length and D is the diameter of the innermost tube, d is the diameter of one orifice in said array of orifices in said innermost tube, N is the number of orifices in the innermost tube, A_{por} is the cross sectional area of each of said orifices, and A_{tube} is the cross sectional area of the interior of said innermost tube; and

the outermost tube has the following properties:

D_{eff} and D_{in} are within a factor of three of each other

$SurfaceArea_{outer}/NA_{outer} \approx 10$ or more

where D_{eff} is the an effective diameter of the effective annular space, $SurfaceArea_{outer}$ is the surface area of the outermost tube, NA_{outer} is the total cross sectional area of all of the orifices in the outermost tube, and D_{in} is the inner diameter of the innermost tube, ~~to promote~~ ~~substantially uniform such that~~ delivery of the gas out of the orifices in the outermost tube ~~and is~~ substantially uniform along the substantially the length of the outermost tube over a range of operating conditions.

Claim 2 (Cancelled)

Claim 3 (Original) The gas delivery metering tube of claim 2 wherein D_{eff} is approximately equal to D_{in} .

Claim 4 (Cancelled)

Claim 5 (Currently amended) The gas delivery metering tube of claim 1 wherein $SurfaceArea_{outer}/NA_{outer} > 100$.

Claim 6 (Original) The gas delivery metering tube of claim 1 wherein said metering tube is used in a chemical vapor deposition system.

Claim 7 (Cancelled)

Claim 8 (Cancelled)

Claim 9 (Original) The gas delivery metering tube of claim 1 wherein the nested tubes are cylindrical.

Claim 10 (Original) The gas delivery metering tube of claim 1 wherein the nested tubes are rectangular.

Claim 11 (Original) In combination, the gas delivery metering tube of claim 1 and at least one injector assembly having at least one port for receiving said gas delivery metering tube.

Claim 12 (Original) In combination, the gas delivery metering tube of claim 1 and at least one shield assembly having at least one plenum for receiving said gas delivery metering tube.

Claims 13 to 16 (Cancelled)

Claim 17 (New) A gas delivery metering tube, comprising:

an inner tube having opposite first and second ends, and a plurality of orifices distributed along a substantial length of the inner tube between the first and second ends, the inner tube being configured to allow introduction of a gas into the inner tube at the first end and to provide an outflow of the gas through the plurality of orifices, the plurality of orifices being sized and numbered to establish a substantially uniform backing pressure within the inner tube despite the introduction of the gas at the first end and the outflow of the gas along the substantial length of the inner tube, which tend to cause gas pressure in the inner tube to decrease substantially along the substantial length of the inner tube from the first end to the second end; and

an outer tube nested and axially aligned with the inner tube so that an annular space is

formed between the inner and outer tubes to receive the outflow of the gas from the inner tube, the outer tube having first and second ends disposed proximately to respective ones of the first and second ends of the inner tube and a plurality of orifices distributed along a substantial length of the outer tube to allow the gas in the annular space to flow out of the outer tube, the outer tube being configured such that a cross sectional area of the annular space is within a factor of three of a cross sectional area of the inner tube and a total cross sectional area of the plurality of orifices in the outer tube is equal to or less than one tenth of a surface area of the outer tube to promote pressure uniformity within the annular space and uniform outflow of the gas along the substantial length of the outer tube.

Claim 18 (New) The gas delivery metering tube of claim 17 wherein the cross sectional area of the annular space and the cross sectional area of the inner tube are approximately equivalent.

Claim 19 (New) The gas delivery metering tube of claim 18 wherein the total cross sectional area of the plurality of orifices in the outer tube is equal to or less than one hundredth of the surface area of the outer tube.

Claim 20 (New) The gas delivery metering tube of claim 17 wherein the total cross sectional area of the plurality of orifices in the outer tube is equal to or less than one hundredth of the surface area of the outer tube.

Claim 21 (New) The gas delivery metering tube of claim 17 wherein the total cross sectional area of the plurality of orifices in the inner tube is about the same as the cross sectional area of the inner tube.

Claim 22 (New) The gas delivery metering tube of claim 17 wherein the plurality of orifices in the inner tube form an inner array of orifices and the plurality of orifices in the outer tube form an outer array of orifices, and wherein the inner and outer arrays of orifices are rotationally offset by about 180 degrees from each other.

Claim 23 (New) The gas delivery metering tube of claim 17 wherein the substantial length of the inner tube is about 68 times a diameter of the inner tube.

Claim 24 (New) The gas delivery metering tube of claim 23 wherein the substantial length of the outer tube is slightly longer than the substantial length of the inner tube.

Claim 25 (New) The gas delivery metering tube of claim 17 wherein an inner diameter of the inner tube is about 0.114 inch and an outer diameter of the inner tube is about 0.134 inch.

Claim 26 (New) The gas delivery metering tube of claim 17 wherein an inner diameter of the inner tube is about 0.136 inch and an outer diameter of the inner tube is about 0.156 inch.

Claim 27 (New) The gas delivery metering tube of claim 17 wherein a diameter of one of the plurality of orifices in the inner tube is smaller than a diameter of one of the plurality of orifices in the outer tube.

Claim 28 (New) The gas delivery metering tube of claim 27 wherein a diameter of each of the plurality of orifices in the inner tube is about 0.0095 inch to about 0.014 inch, and a diameter of each of the plurality of orifices in the outer tube is about 0.0138 inch to about 0.0153 inch.